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US EPA RECORDS CENTER REGION 5



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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 5

230 SOUTH DEARBORN ST.
CHICAGO, ILLINOIS 60604

NOV 30 1989

REPLY TO ATTENTION OF: 5HS-11

Paul Dugas
Sr. Environmental Engineer
Maxus Energy Corporation
23200 Chagrin Blvd.
Four Commerce Park Square
Suite 600
Beachwood, OH 44122

Re: Requested Changes in
Analytical Procedure Diamond
Shamrock Painesville,
Ohio Site

Dear Mr. Dugas:

U.S. EPA has completed the review on the July 31, 1989 report on groundwater and river water monitoring results. Attached to this letter is the review that has been previously faxed to you on November 28, 1989. U.S. EPA has a number of questions and comments on the new procedures. Please respond to these comments within 30 days of receipt of this letter. U.S. EPA will be willing to have a meeting to explain any of the comments if requested.

Please call me at (312) 886-1476 if you have any questions.

Sincerely,

David Wilson
Remedial Project Manager



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 5

230 SOUTH DEARBORN ST.

CHICAGO, ILLINOIS 60604

REPLY TO THE ATTENTION OF:

5SMJA

MEMORANDUM

DATE: **NOV 21 1989**

SUBJECT: Review of the Report on Groundwater and River Water Monitoring Results for the Painesville (Dimond Shamrock) Site, Ohio

FROM: *Maureen C. Long*
James H. Adams, Jr., Chief
Quality Assurance Section

TO: Donald Bruce, Chief
Ohio/Minnesota Section

ATTENTION: Dave Wilson, RPM

We have reviewed the report on the groundwater and river water monitoring results, which include the request for changes in analytical procedures, for the Painesville (Dimond Shamrock) site, Ohio. This report was officially received by the Quality Assurance Section (QAS) on August 3, 1989 and was treated as a low priority document. However, a partial verbal comment was transmitted by phone to RPM on September 19, 1989. The current memorandum documents QAS completed comments on the analytical results of hexavalent chromium and total chromium analyses, and the requests for changes in analytical procedures.

Our comments on each issues are summarized as follows:

A. Method 218.4

It is requested that EPA Method 218.4 shall be used to replace the current method used for the analysis of hexavalent chromium on the ground that the current method is in accord with method 218.4. We do not think this request is acceptable because the current method, which is a colorimetric method, is different from the Method 218.4 which is an Atomic Absorption (AA) spectrometric method.

B. Sample Decantation vs Sample Filtration

We disagree that preparation of samples for hexavalent chromium analysis by decantation shall be replaced with filtration of samples through a 0.45 micro filter because the following reasons:

1. Throughout the reports, there is no detailed documentation on how the turbidity blank samples are actually prepared. It is not clear what is

the homogeneity between the samples for turbidity blanks and for hexavalent chromium analysis respectively.

2. The data provided in the report have shown that the concentrations of Cr(VI) detected in the decanted samples are relatively lower than that of filtered samples. However, we do not think the difference between the decanted samples and filtered samples shall be so great. We think these low results of decanted samples are resulted from inappropriate handling of the measurement and subtraction of the absorbance of the turbidity blanks from the absorbance of samples. The absorbance of decanted samples are apparently oversubtracted by the background absorbance which measured from the turbidity blank samples.

We suggest that the following approaches be taken to reduce the interference of the suspended solid:

1. Centrifuge shall be used to enhance the settlement of any suspended solid, and thus reduce the turbidity of the samples, which in turn will increase the homogeneity of the samples.
2. Cautions shall be exercised to ensure the homogeneity between the turbidity blank samples and Cr(VI) analysis samples, before and after addition of acid and color developing agent.
3. Same amount of time allowed for the color development of the samples for Cr(VI) analysis shall also be applied to the turbidity blank samples.

C. Replacing Existing Quality Control Criteria with That of Draft Statement of Work, Low Concentration for Inorganic Analytes, 2/89

It is not acceptable to replace the existing quality control criteria with the draft Statement of Work, Low Concentrations, for Inorganic Analytes, 2/89 because of the following:

1. The referenced SOW is only a draft document. The most current draft of this document is 10/89).
2. The criteria specified in this draft SOW is not applicable to the analysis of hexavalent chromium analysis required for the project.

D. Use of Method of Standard Addition

It is requested that the Method of Standard Addition (MSD) be approved to be used for this project; however, it fails to specify the following:

1. Under what condition, the MSD will be used is not addressed.

2. How the MSD to be done in each analysis is not addressed.

We therefore suggest that MSD shall not be used for the project until the missing information are addressed. A standard Operating Procedure (SOP) containing the details shall be submitted for review/approval.

E. Inductively Coupled Plasma (ICP) Analytical Technique

It is proposed that ICP technique be approved as an alternate technique for the analysis of samples with high concentration of chromium (both hexavalent Cr and total Cr). We have no objection in accepting the use of ICP for total chromium analysis in high concentration samples, however, it is not acceptable for hexavalent chromium analysis. It is necessary that, the "high chromium concentration" shall be properly defined, and the quality assurance practice and criteria to be implemented shall also be provided to Agency for review and approval. Furthermore, it is not clear whether the ICP technique will completely replace AA technique for the analysis of total chromium in all samples regardless the concentration level of samples. This shall also be properly specified in the amendment.

F. Delete of Hexavalent Chromium Parameter From the Analytical Program

It is proposed to drop the hexavalent chromium parameter from the analytical program on the ground that the total chromium measurements serve as a check, or upper bound for hexavalent chromium. We do not agree with this argument because the following reasons:

1. The measurement of hexavalent chromium and total chromium provide different information required for the project.
2. Samples for hexavalent chromium and total chromium analyses are prepared differently. The total chromium samples are prepared by filtration while the hexavalent chromium by decantation.
3. The results of the hexavalent chromium provide a check for the analytical of results of the total chromium analysis.

G. Data Acceptability

From our review, we conclude that the data is not fully acceptable because they, in many cases, exceed the required QC requirements:

1. We have difficulties in reproducing the calculated data present in the report. For example, the correlation coefficients of linear regression analysis of the calibration data are, according to our calculation, are generally poor, compared to that reported.

2. The recoveries of the analysis of reference standard, according to our calculations, are generally exceed the required criteria, which is 90%-110%.
3. The data of the hexavalent chromium analysis obtained from the decanted samples are not acceptable. See comment B of this memo.

cc: Cheng-ien Tsai, ESD/QAS